A Review on Radiation Effects Towards Cell Culture

Nur Farhana Mat Nawi[1], Zainul Ibrahim Zainuddin[2], Munirah Sha'ban[1]

[1]Department of Biomedical Science, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera Mahkota, 25200 Kuantan, Pahang Darul Makmur, Malaysia

[2]Department of Diagnostic Imaging and Radiotherapy, Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Jalan Sultan Ahmad Shah, Bandar Indera, Mahkota, 25200 Kuantan, Pahang Darul Makmur, Malaysia

INTRODUCTION

Radiation

http://all-free-download.com/free-vector/download/radioactive_117181.html

+

Cell Culture

http://www.aiche.org/....biomolecular-engineering-cell-and-tissue-engineering

Objective

The study aims to identify and evaluate previous works that examined the possible effects of radiation on cells

Methodology

Scopus (2001→2016)

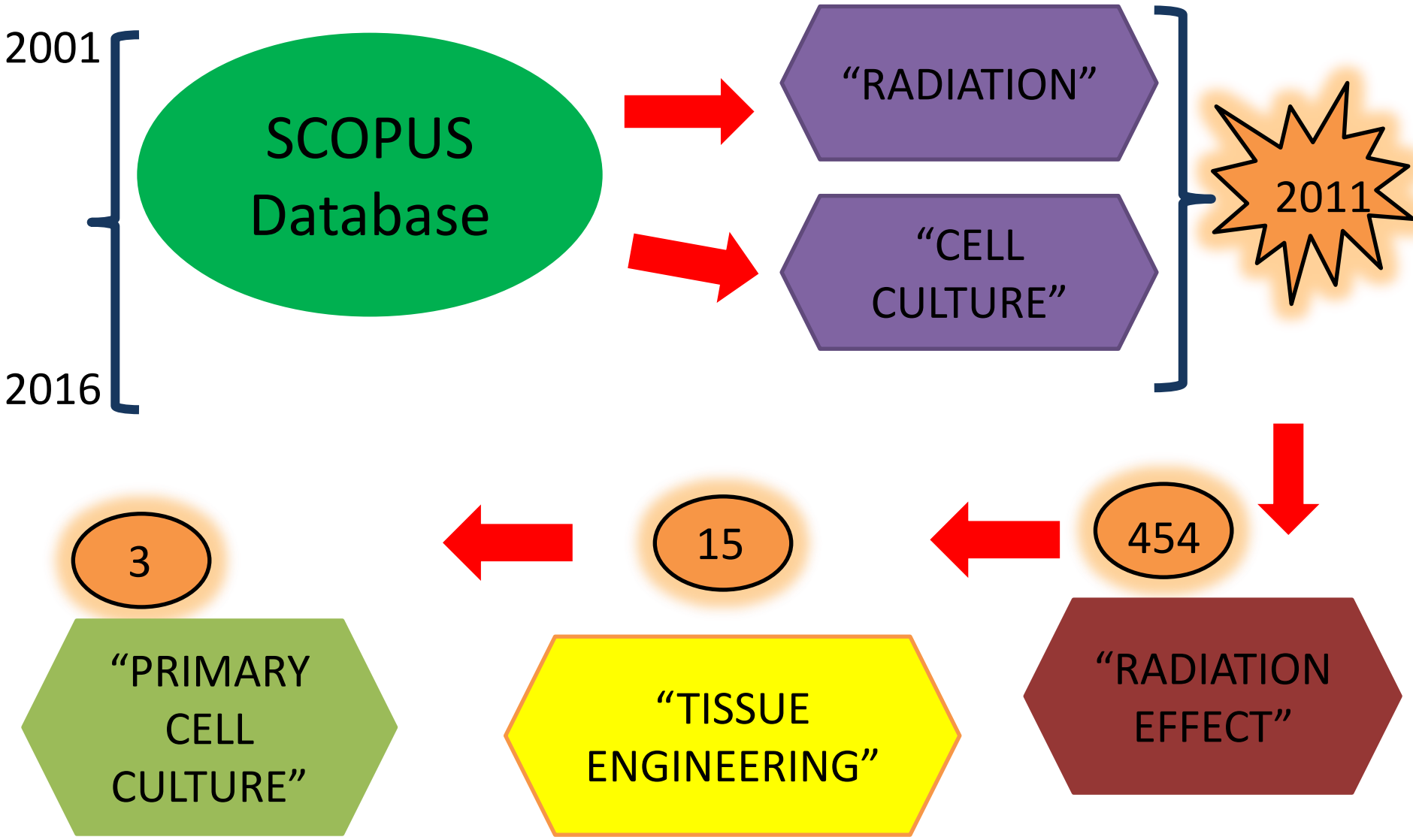
↓

"Radiation", "cell culture", in the title, abstract or keywords

↓

Filtering to "radiation effects", "tissue engineering area" and "primary cell culture"

Results & Discussions



Results & Discussions

- Ionizing radiation encourages cellular senescence of articular chondrocytes (Hong EH, Lee SJ, Kim JS, et al., 2010)

- Radiation induced an active degradation of cartilage and reduced the proteoglycan synthesis. It may cause a functional decline of cartilage health in joints after exposure, contributing to arthropathy (Willey JS, Long DL, Vanderman KS, et al., 2013)

Conclusion

- The results show a certain trend towards the incompatible effect of radiation on primary cell culture
- Work is in progress in filtering the keywords further to narrow the scope to radiation effects on chondrocytes in the title, abstract or keywords of the articles

Scopus

WEB OF SCIENCE™

Future Work

- To include other databases ; WOS, Pubmed and Google Scholar

Scopus

وَمَا خَلَقْنَا ٱلسَّمَآءَ وَٱلْأَرْضَ وَمَا بَيْنَهُمَا لَٰعِبِينَ ١٦

We did not create the heavens and the earth just for fun.

(Surah Al-Anbiya' 21:16)

WEB OF SCIENCE™

- ✓ Kulliyyah of Allied Health Sciences, International Islamic University Malaysia, Kuantan Campus
- ✓ Ministry of Science and Technology for their support and for providing Science Fund Grant (SF14-012-0062)

In Grateful Appreciation

References

- Dounia H. H., Francois ,Chevalier., Jean-Emmanuel, G., Florent, D., Jean-Yves, T., Carl , M., Yannick, S. Comparable Senescence Induction in Three-dimensional Human Cartilage Model by Exposure to Therapeutic Doses of X-rays or C-ions. International Journal of Radiation Oncology. 2015
- Rozlin,, A. R., Norhamiza, M. S., Noorhidayah, M. N., Muhammad, A. A. R., Ahmad, H. Z., Aminuddin, C. A., Abdurezak, A. H., Suzanah, A. R., & Munirah, S. The Potential Of 3-Dimensional Construct Engineered From Poly(Lactic-Co-Glycolic Acid)/fibrin Hybrid Scaffold Seeded With Bone Marrow Mesenchymal Stem Cells For In Vitro Cartilage Tissue Engineering. Tissue and Cell 47. 420–430. 2015.
- Munirah, S., Soon, H. K., Ruszymah, B. H. Idrus., and Gilson, Khang., Fibrin and Poly(Lactic-co-Glycolic Acid) Hybrid Scaffold Promotes Early Chondrogenesis of Articular Chondrocytes: An In Vitro Study. Journal of Orthopaedic Surgery and Research. 3:7, 2008
- Hong EH, Lee SJ, Kim JS, et al. Ionizing radiation induces cellular senescence of articular chondrocytes via negative regulation of SIRT1 by p38 kinase. J Biol Chem 2010;285:1283-1295